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ABSTRACT

The Resource Allocations and Management Program grant funds a project aimed at facilitating the use of management science and information systems techniques by developing, documenting, and testing a methodology that small postsecondary units can use in considering the application of these tools. This document provides a description and an overview of the data collection methods used in this project. In developing the review phase, the thrust is to provide an approach that is based on data collection and analysis and is systematic in nature. Also developed is a general description of the review phase structure that forms a basis for the development of specific data collection methodology. (Author)

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COLLEGE MANAGEMENT SYSTEM IMPROVEMENT PROJECT

CENTER FOR ACADEMIC ADMINISTRATION RESEARCH

of the

COLLEGE OF EDUCATION AND

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COLLEGE MANAGEMENT SYSTEM IMPROVEMENT PROJECT

College Management System Improvement:

Overall Description of the Review Phase*

Working Paper

CMSIP-WP-74-2.1

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PREFACE

This paper discusses the review of management systems in the context of a research project that is aimed at improving the management system of a small postsecondary unit. It is one of a series of working papers that document a general approach to the improvement of management systems in such organizations. The series of papers is being prepared by members of the College Management System Improvement Project team at the University of Minnesota. Research efforts of the team are being supported by the Exxon Education Foundation through its Resource Allocation and Management Program grant to Augsburg College, Minneapolis, Minnesota. The research efforts of the project are aimed at facilitating the use of management science and information systems techniques by developing, documenting, and testing a methodology that small postsecondary units can use in considering the application of these tools.

In order to avoid the complexity of problems and organization involved in the administration of multi-college multi-campus institutions, the methodology was developed for a college-size unit (enrollment of 1,000-5,000). These units could be independent or part of a larger institution or system. While the project investigators are particularly sensitive to the human considerations of organizational change, the primary focus of the proposed methodology is on changes to the structural aspects of the organization. Thus, the project focuses on organizational features such as decision procedures, formats, and information availability.

Figure 1 indicates the topics to be covered in each of the papers in the project series. A box has been drawn around the subject of this paper.

FIGURE 1

COLLEGE MANAGEMENT SYSTEM IMPROVEMENT DOCUMENTATION

- An Overview of the Approach

THE REVIEW PHASE	THE DESIGN PHASE	THE IMPLEMENTATION PHASE
• An Overall Description	• An Overall Description	• An Overall Description
• Institutional Goals	• Choosing Major Improvement Areas	• Establishing the Project Management Plan
• Managerial Topics	• Developing Alternative Courses of Action for each Improvement Area	• Developing Detailed Change Plans
• Operating Topics	• Selection of a Final Design	• Training and Implementation
• Environmental Context	• Project and Management System Evaluation	• Project and Management System Evaluation
• Project and Management System Evaluation		

As can be seen from Figure 1, the improvement approach has three main parts: 1) the Review Phase, 2) the Design Phase, and 3) the Implementation Phase. The Review Phase describes the existing management system and the needs for improvement. The Design Phase identifies major management system improvement areas based on data from the Review Phase and it generates design improvements for each of those areas. The Implementation Phase implements and evaluates the resulting new management system. The reasoning behind the three phase structure and a brief description of the methods used in each phase is contained in the series overview paper [2].

INTRODUCTION

This paper provides a description of the structure of the review phase and an overview of the data collection methods used in this phase. The approach is defined below for colleges, the type of postsecondary institution, where it is being applied by the authors. However, the methodology could almost certainly be applied to other types of organizations as well.

Two existing bodies of literature are related to the review of management systems. The first of these is the general management literature (eg., Anthony [3], Ackoff [1], Koontz and O'Donnell [7], and McGuire [8]). This literature has advocated basic principles of management, but they are far too broad to be of direct use in collecting data for the review of an existing management system and they do not link the theory to the design of better management systems. As we will see below, however, the structure provided by these principles is necessary for the orderly development of our approach.

The second body of literature is that of systems analysis. This approach is represented by authors such as Glans, et al. [6] and Couger [5]. These authors have tended to discuss very detailed questions about systems operations. They often include checklists, paperwork flow analysis procedures, flowcharting, and other techniques which are used to analyze the clerical or operating subsystems of an organization. The approach tends to be ad hoc in nature and it presumes the type of improvements which are needed. Moreover, the systems analysis approach has not in the past concentrated sufficiently on the planning and control functions of management. Rather, it has been primarily concerned with improving operations.

There is a need for the development of better methods for the review of management systems. In developing the review phase, the thrust is to provide an approach which is based on data collection and analysis and is systematic in nature. The next section provides a general description of the review phase structure which forms a basis for the development of specific data collection methodology.

DESCRIPTION OF REVIEW PHASE STRUCTURE

The purpose of the review phase is to collect data which can be used for (1) the design of an improved management system and (2) evaluation of improvements after they have been made. Data collection is at the heart of the review phase. By carefully structuring the data collection, some of the ad hoc nature of other methods will be avoided.

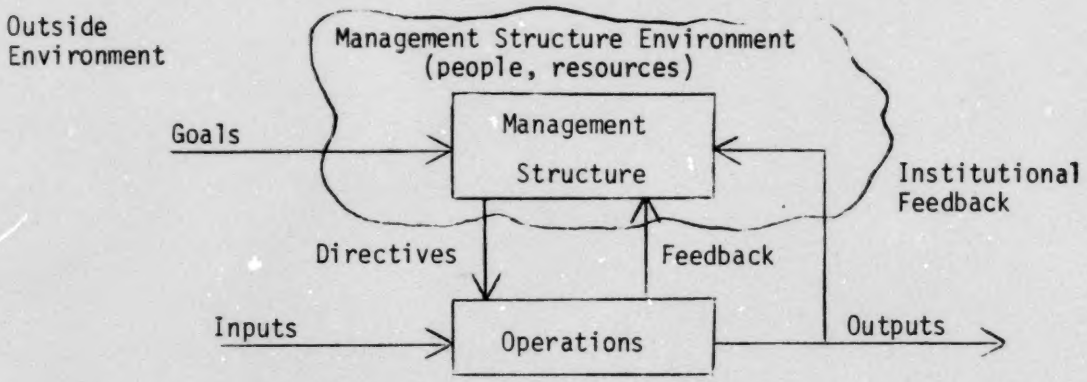
The discussion of the review phase structure is organized into four parts; systems definitions, selection of subsystems for review, the components of the review phase, and a framework for data collection. Each of these parts contributes to the overall structure of the review phase process.

Systems Definitions

In describing the review phase it is useful to provide a systems view of an organization. This will help define what is meant by words such as "the management system" and "the operating system." The concept of an organization as a system is shown in Figure 2 and the components of that system are described below.

FIGURE 2

DESCRIPTION OF AN ORGANIZATION AS A SYSTEM



Some of the elements of the above figure are defined as follows:

Management Structure - Consists of procedures, policies, and methods that direct the operations of the organization. It consists of a set of managerial activities that are used to set goals, plan, make policy, manage resources, implement plans, and evaluate results.

Management Structure Environment - Consists of the people and resources that are used in connection with the structure to direct the operations of the organization.

Management System - The management system consists of the management structure together with its environment.

Operations - Consists of programs and activities that produce the outputs (services and products) of the organization. These operations are directed by the management system.

An organization includes both a management system and operations. The review phase being discussed in this paper is concerned with the review of the management system. It excludes the review of operations for the purpose of operating improvements. Operations are reviewed only in terms of their relationship to the management system.

Selection of Subsystems for Review

Since an entire system cannot usually be reviewed as a whole, it is important to subdivide the system into components or parts. Three methods of subdivision

were considered: by processes (activities), by organizational components, or by functional operating subsystems. In an entirely comprehensive review, data should probably be collected by all three methods of subdivision, since each method provides information from a different viewpoint. However, most circumstances would probably not allow such a comprehensive review.

A process subdivision method was developed for this study. If one were looking for organization structure weaknesses, then it would be appropriate to collect data by organizational units. The focus for review here is not on organizational changes, therefore, the organizational method is not of primary importance. On the other hand, the method of dividing the system into functional operating subsystems is particularly useful when changes in operations are desired because functions are typically defined from an operating standpoint, see for example Couger [5]. Again, changes in operations are not the primary interest of this paper.

Thus, a process subdivision method was developed because it relates primarily to a management system orientation. Such a division may cut across organizational units and levels of responsibility. A precise definition of a process and the entire list of processes designed for college management system review is included in Appendix A - a brief summary follows.

In general terms a process consists of one or more activities which are closely related in purpose. The inputs to a process consist of physical resources, information, or decisions from other processes. Outputs of processes are decisions, information, or services to the college or its constituents. Examples of college processes are registration, budgeting, and faculty promotion.

Processes are grouped into four main categories:

I. Strategic Decision Making

II. Institutional Resource Management

III. Instruction

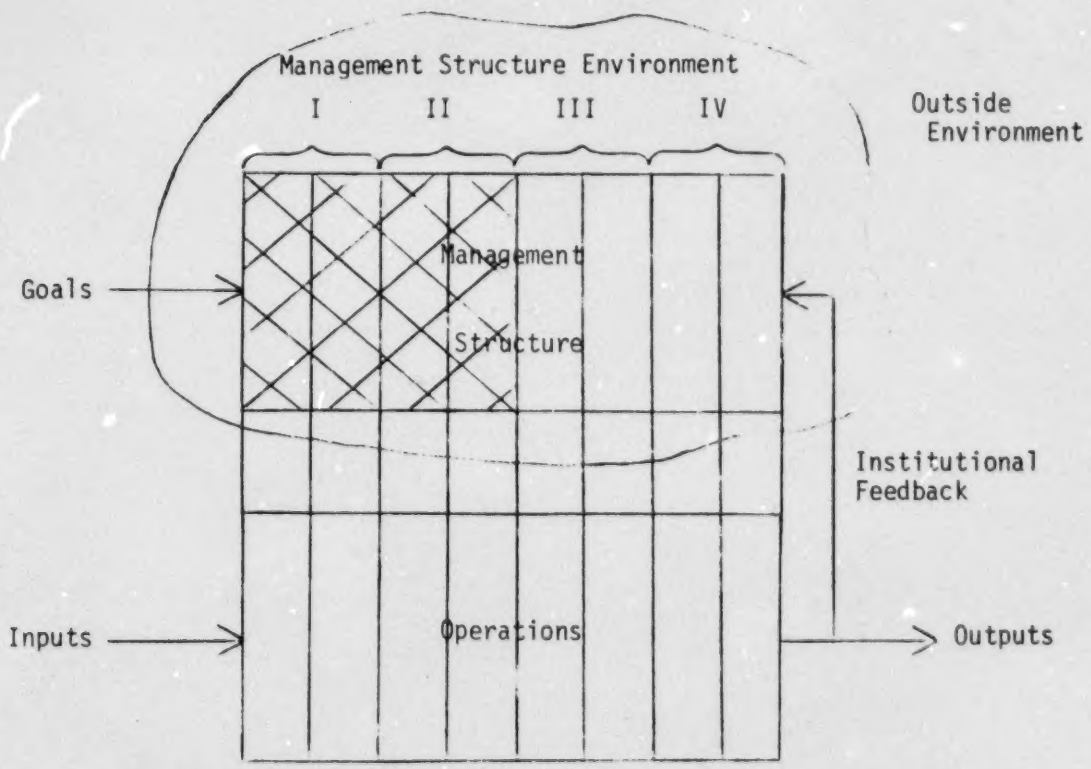
IV. Support

Processes in categories I and II are institutional in nature, while those in categories III and IV are departmental in nature. Generally speaking, categories I and II contain those processes which operate at the central administration level and affect more than one department, e.g., budgeting. Processes in categories III and IV are usually operated by some particular department.

Each process includes both managerial (primarily decision making) aspects and operations aspects. Thus, processes cut across the college system as shown in Figure 3. Based on this interpretation it is inappropriate to think of a management process or an operating process, since the definition of a process includes both managerial and operating aspects.

FIGURE 3

PROCESS DIVISION OF AN ORGANIZATION



Components of the Review Phase

A third aspect of the review phase structure is the data collection methods used for the review activity. In order to help organize the data collection of the review phase it is useful to categorize the data collection efforts into several sets of data collection methods. Each of these sets of methods is referred to below as a component of the review phase. The five components are briefly defined below.

1. Managerial Topics: This component reviews the management structure in process categories I and II (cross-hatched in Figure 3). Thus, managerial topics is a review of institutional managerial activities including strategic policy making and institutional resource management. In a college this component would usually include activities conducted by the president, board of trustees, vice presidents and their assistants, faculty senate, and student senate.
2. Operating Topics: This component reviews the operations and departmental management system of the college as they relate to managerial structure. Particular focus is on the relationship of departmental management to institutional management and on the management information available from the operations of the college. A relationship to management structure is the key--operations are not reviewed for the sake of independent operating improvement. Usually, the operating topics component of review will involve academic and non-academic department heads, since they are most directly concerned with operations.
3. Environmental Context: This component deals with the environment of the management structure. The particular focus is on how the environment constrains or facilitates particular improvements which can be made in the management structure. Constraints and facilitators relating to people, facilities, and funds are reviewed.

4. Institutional Goals: This component describes the goals and goal setting process of the institution. In determining the design of a new system, the question of what the system is supposed to accomplish arises time and again. Thus, it is of fundamental importance to understand institutional goals from the broadest possible viewpoint before a new design is developed. Also, in any revised management system the goal setting process will have a prominent role. This component of the review phase would usually solicit data from a broad segment of the college (board of trustees, administrators, faculty, students, and alumni) since they all influence the college goals.

5. Project and Management System Evaluation: Part of the project determines the extent to which the system is actually improved after changes have been made. Thus, the review phase must establish a base-line against which change can be evaluated. The project and management system evaluation component of the review phase determines what base-line measures should be developed and how they would be used. Most of the base-line data consists of the outputs of components one through four which are reorganized for evaluation purposes. It is also likely that some of the evaluation measures will be institutionalized as part of the revised management system.

A Framework for Data Collection

In order to meet the needs for design, implementation and evaluation, the framework for data collection includes three perspectives; current status, desired status, and priority of desired changes. The current status describes the management system as it is now. It determines the present state of the system with respect to dimensions of interest. Desired status provides a description of the system as various constituents think it should be. Generally, a description of desired status will require a variety of points of view, since desired status will usually vary among individuals. The desired status will usually be measured along the

same dimensions as current status so that differences can be used to identify needed changes. To determine how badly an improvement is needed in relation to other improvments an assessment of the relative importance of specific changes is also required. This leads to the third dimension of the review phase, priority for change.

Combining the three dimensions for review and the five components results in the framework for data collection shown in Figure 4. Each of the X's represents a set of data that is collected as part of the review phase.

FIGURE 4

A FRAMEWORK FOR DATA COLLECTION IN THE REVIEW PHASE

	Dimensions		
Components	Current Status	Desired Status	Priorities for Change
Managerial Topics	X	X	X
Operating Topics	X	X	X
Environmental Context	X	X	X
Institutional Goals	X	X	X
Project and Management System Evaluation	X	X	X

OVERVIEW OF DATA COLLECTION METHODOLOGY

The data collection methodology for each of the five review phase components is described below. Only an overview of the methodology is given here; other papers indicated in Figure 1 describe the methods for each component in more detail.

Managerial Topics

The managerial topics component collects data on the managerial structure of processes at the institutional level. It describes these processes by means of a three step approach.

Step 1: Description of process inputs, procedures, and outputs

Step 2: Evaluation of effectiveness, needs, and priorities for change in the processes

Step 3: Flow charts of process operations and relationships between processes

Step one involves developing a descriptive base on the inputs, procedures and outputs of each process. To begin, a list of about fifteen questions is used which pertains to each process. These questions deal with process characteristics such as purposes and outputs, procedures used, participation and information. This data is collected by personal interviews with administrators (10-20 in a small college). Data is requested on the current status, desired status, and priority for improvements in each process.

Step one also includes the review of existing documents in the college. Examples are goal statements, policy manuals, minutes of board meetings, constitutions, and other important documents which describe the managerial process. Many of these documents are collected during the course of the interviews with administrators.

Step two provides an evaluation of each process in terms of current effectiveness, need for improvements of various types, and priorities for change. Data from step two is collected by a mail questionnaire consisting of about 10 questions on each of fifteen processes. The questionnaire is administered to all individuals who are familiar with the processes. In a small college the number of questionnaires administered could range from 10 to about 50 depending on the size of the college. This data helps provide an assessment of needed

improvements and is also used to evaluate the effect of changes after they have been made.

Step three of managerial topics is concerned with collecting data on current relationships between processes and on the relationship between activities within processes. It traces information flows in general terms from one process to another by means of a block diagram flow chart. The information is collected by informal discussions with administrators supplemented by data collected in step one. The data is used to identify general problems that occur in information and communications flows between processes.

Step three also includes drawing an activity flow chart of each process. The flow chart describes the major decisions and other activities which are included in the process, the types of information used, and how the activities relate to each other. These flow charts are drawn by an analyst in discussions with administrators who are familiar with the process.

In summary, managerial topics provides data on managerial processes at the instuitutional level. That data is designed to identify processes and relationships which need improvement, to indicate what types of improvements are desired and to provide a base-line for evaluation of changes after they are made.

Operating Topics

The operating topics area collects data on the relationships of the operating system to the management structure. The data collection focuses on two steps: (1) identification of current information available and desired information in the organization; and (2) problems in departmental relationships with other departments and with institutional management.

The information review step begins with a series of interviews designed to determine what information is currently used in each process. These interviews

would utilize the flow charts described in step three of managerial topics as a basis for relating managerial procedures to information utilized. After the first set of interviews, the analyst would examine the major data files in the organization. This examination helps identify the condition of the data base used to provide current information and the existence of data not presently used by the processes. After collecting data on the institution's major files, this step uses a series of interviews with decision makers on information needs. These interviews relate data currently available in the files to needs and priorities as perceived by the persons responsible for the decisions. There is also an opportunity for interaction between the analyst and the decision makers based on the analysts logical review of the information system.

The review of relationships between departments and relationships with institutional management develops data on possible problems in those relationships. The types of problems are identified by several dimensions; guidance, timing, level of workload, communications, participation, and responsibilities. The focus is on problems that can be related to institutional policies or structure. That data is used to determine whether management system changes are needed to improve relationships between operating functions and institutional management. The data is collected by means of a series of structured interviews with academic and non-academic department heads.

Institutional Goals

The institutional goal component provides an indepth study of institutional goals as perceived by the students, faculty, administrators, alumni and the board of trustees. One way to carry out this study is to use an instrument like the Institutional Goals Inventory from Educational Testing Service. That instrument includes ninety goal statements plus allowance for up to twenty additional goal statements from the institution itself.

There are three uses of institutional goal data:

(1) To indicate desired directions that members of the college feel should be pursued. Those desired directions in turn can influence design of the management system.

(2) To indicate problem areas where the direction that is being pursued is not in agreement with the direction that one or more of the constituent groups feel should be pursued. Recognition of these kinds of problems can trigger a search for explanations and solutions and thereby result in management system changes.

(3) To indicate a degree of consensus or lack of consensus between different groups such as students and faculty. Discrepancies may indicate a need for better communications or constraints that must be recognized. Similarities in goals may indicate strengths that should be pursued.

All of these uses contribute to the design improvements and to the base-line evaluation. In addition, the data collected is usually of direct use in improving the information available to the college for its goal setting process.

Environmental Context

The environmental context area identifies constraints and facilitators which affect the design options for improvements to the management system. Types of constraints and facilitators include personnel, financial, and facilities. Data in this area is collected by interviews with individuals or small groups and by screening of the data from other parts of the review phase.

The data gathered for the environmental context component is primarily related to the design effort. It indicates in general terms which design directions are feasible (constraints) and which directions might be the most desirable (facilitators). Such data is useful in developing alternatives and opportunities for problem solution.

Project and Management System Evaluation

The project and management system evaluation component is aimed at evaluating changes that have been made as a result of the project. In order to evaluate these changes a base-line is established prior to implementation of the new management system. The same dimensions of the base-line are also measured after implementation and differences are observed. These differences must then be interpreted to assign probable cause and thereby separate the effects of management system changes from other outside influences. The result is an assessment of success of the new management system and the project which produced it.

Base-line evaluation data is obtained primarily from the other parts of the review phase. Each of those parts documents the current status of the management system prior to any changes. That data which is considered pertinent forms a part of the base-line evaluation data. The detailed methodology indicates what data is needed for base-line evaluation and prescribes a method for developing that data.

SUMMARY

The review phase of the college management system improvement project collects data that is to be used for (1) the design of an improved system and (2) the evaluation of the resulting system after implementation. This paper provides a structure for collecting the review phase data and an outline of the data collection methodology.

The review phase structure includes definitions of a management system, selection of the subsystems which are used for review purposes, definitions of the review components and the data collection framework. The framework consists of defining five components and three dimensions. Each component is a set of

methods related to a particular aspect of the system under review. The components of the review phase are: managerial topics, operating topics, institutional goals, environmental context, and project and management system evaluation. The three dimensions are: status of the current system, desired status, and priorities for change.

A variety of data sources are used to document the current status, desired status, and priorities for change in the management system. The general nature of these sources is indicated below.

	Mail Survey	Personal Interviews	Document Collection
Managerial Topics	X	X	X
Operating Topics		X	X
Environmental Context	X	X	X
Institutional Goals	X		X

The data collected in the review phase permits a definitive assessment of changes that are needed in the management system and a basis for evaluation of the changes which are made.

Appendix A

A Specification of Processes for Small Colleges

1. Definition of a Process: A process consists of one or more activities which are closely related in purpose. Inputs to a process consist of physical resources, information, or decisions from other processes. Outputs of processes are decisions, information, or services to the college. For example, registration, budgeting, and faculty promotion are all processes.

2. Categories: The processes specified include all aspects of college management and operations. The four main categories are:

   I Strategic Decision Making

   II Institutional Resource Management

   III Instruction

   IV Support Services

3. Functions: Each process may include aspects of the functions; planning, control, and operations. However, some processes may involve mostly (or only) planning while other processes may be primarily operating in character. The functions of planning, control and operations, cut across each process.

4. Level of Detail: The level of detail of specification of each process is related to each particular college. For example, if faculty, administrator, and staff promotions are all handled by the same procedures, then there would only be a single promotion process. If there are different procedures used for each group, there would be three different promotion processes.

5. Level of Organization: All levels of college organization are covered by the list of processes. A particular process may cut across different organizational units and levels.

6. Completeness of Framework: The process framework is intended to be a complete specification of all management and operating activities that a college undertakes. In that sense it will include all of the activities found in a "typical" small college.

Small College Processes

I. Strategic Decision Making

A. Institutional Goal Setting

B. Academic Program Review

C. Institutional Policy Making
(Ad staff, Faculty Senate, Student Council)

D. Curriculum Review (including course offerings)

E. Organizational Structure

II. Institutional Resource Management

A. Financial

1. Budgeting
2. Fund Raising

B. Facilities

1. Acquisition of Buildings and Land
2. Assignment of Rooms
3. Equipment Acquisition and Usage

C. Personnel (Faculty, Staff, Administrative)

1. Allocation of Positions
2. Personnel Policy Making
3. Promotion
4. Recruiting

III. Instruction

Each academic department constitutes a process.

IV. Support Services

A. Business Services

1. Accounting and Finance

a. General Ledger
b. Accounts Payable
c. Accounts Receivable
d. Payroll
e. Control of Receipt and Disbursement of Funds
f. Cash Budgeting
g. Cost Analysis of Operations
h. Management of Investments
i. Internal Audit

2. Purchasing and Inventory

a. Purchase Order Processing
b. Inventory Management Control

3. Management of Auxiliary Enterprises

a. Data Processing
b. Athletics
c. Residence Halls
d. Food Services
e. Bookstore
f. Laundry
g. Health Service
h. Printing Shops
i. Student Unions
j. Police and Security
k. Parking
l. Transportation

4. Management of Physical Plant Services

a. Maintenance
b. Custodial

B. Student Services

1. Admissions and Recruitment

2. Registration (includes sectioning)

3. Student Counseling

4. Grades and Records

5. Placement

6. Financial Aid

7. Advising

C. Academic Support

1. Library

a. Cataloging
b. Circulation
c. Acquisitions

D. Development

1. Public Information

2. Alumni and Community Relations

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